

## WHAT IS CLAIMED IS:

1. A rare earth hydroxide in the form of a powder of which the crystallite diameter does not exceed 40 nm by the X-ray diffractometric method and the contents of chlorine and nitrate ions as impurities do not exceed 300 ppm by weight and 100 ppm by weight, respectively.

2. The rare earth hydroxide as claimed in claim 1 of which the weight loss by ignition at 1000 °C for 1 hour is not larger or not smaller by more than 2% by weight than the theoretical value for the conversion of the hydroxide into the oxide.

3. The rare earth hydroxide as claimed in claim 1 of which the secondary particles of the powder have an average particle diameter in the range from 0.1 to 2  $\mu$  m.

4. Neodymium hydroxide in the form of a powder of which the crystallite diameter does not exceed 40 nm by the X-ray diffractometric method and the contents of chlorine and nitrate ions as impurities do not exceed 300 ppm by weight and 100 ppm by weight, respectively.

5. The neodymium hydroxide as claimed in claim 4 of which the weight loss by ignition at 1000 °C for 1 hour is not larger or not smaller by more than 2% by weight than the theoretical value for the conversion of neodymium hydroxide into neodymium oxide.

6. The neodymium hydroxide as claimed in claim 4 of which the secondary particles of the powder have an average particle diameter in the range from 0.1 to 2  $\mu$  m.

7. The neodymium hydroxide as claimed in claim 4 of which the color difference value  $L^*a^*b^*$  gives  $L^*$  of 90 to 95.  $a^*$  of 3 to 6 and  $b^*$  of -10 to -5.

8. A method for the preparation of the rare earth hydroxide defined in claim 1, which comprises the steps of:

- (a) bringing a powder of a rare earth oxide into contact with water either in the liquid form or in the vapor form in an amount of from 1.5 moles to 3.0 moles per mole of the rare earth oxide; and
- (b) keeping the rare earth oxide powder in contact with water at a temperature in the range from 30 °C to 200 °C.

9. A ceramic body which is a sintered body of a ceramic composition comprising the rare earth hydroxide defined in claim 1.